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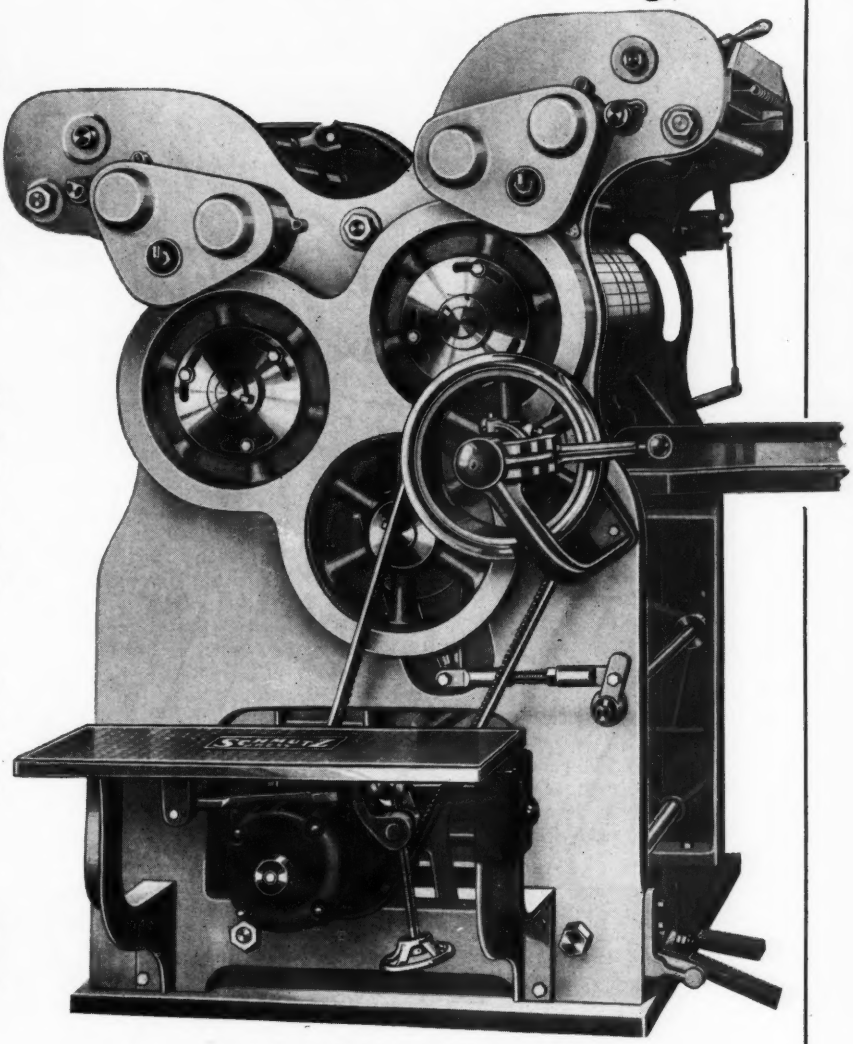

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The American FERTILIZER

Vol. 105 NOVEMBER 2, 1946 No. 9

Proposed Uniform State Fertilizer Bill

Control Officials Association Prepares Measure. Plant Food Content Set at 20 Per Cent Minimum. Official List of Grades Included.

Fertilizer manufacturers would be prohibited from shipping in any state mixed fertilizers containing less than a sum total of 20 per cent of nitrogen, available phosphoric acid, and soluble potash under the provisions of the model State control fertilizer bill to be offered for adoption at next year's meetings of the State legislatures by the newly formed Association of American Fertilizer Control Officials.

The bill, which is designed to bring about uniformity among all the states in the control of fertilizers, was drafted by a special committee of fertilizer control officials and a committee of The American Society of Agronomy. Copies are now being circulated throughout the industry and among other state officials where widespread interest is being shown in its provisions.

In general, the bill seeks to adopt the good features of the various laws of the forty-seven states which now have fertilizer control laws while disregarding those that have been proven difficult of administration and an unnecessary burden on the industry. Uniformity of the laws on this subject is considered highly desirable as it makes for better administration of the laws and favors simplication of operations. It also reduces the costs in the many plants that ship their products across the state lines.

Provisions of the proposed model law providing a minimum of plant food value for mixed fertilizers is in line with the requirements of many of the states, but not all of them. But even those states having minimums in their laws, vary from one to another because they have been adapted to the specific needs of the individual states. This bill would set the sum total minimum for the three ingredients at 20 per cent for all states, which is about the average plant food content of the mixed fertilizers now being produced.

The requiremtn is found in section 10 of the bill which reads as follows:

> Minimum plant food content. No superphosphate containing less than 18 per cent available phosphoric acid, nor any mixed fertilizer in which the sum of the guarantees for the nitrogen, available phosphoric acid, and soluble potash totals less than 20 per cent shall be offered for sale, sold, or distributed in this state except for complete fertilizers containing 25 per cent or more of their nitrogen in water insoluble form of plant or animal origin, in which case the total nitrogen, available phosphoric acid, and soluble potash need not total more than 18 per cent.

Provision is made in the bill for the assessment of penalties for deficiencies in the guaranteed nutrients which are to be paid to the consumer of the lot of mixed fertilizer or fertilizer material represented by the sample analyzed. Payment must be made within three months from the date of notice by the state inspector. These provisions of the bill are comparable to those now in force in the state of North Carolina.

The bill also provides for the registration of each brand of mixed fertilizer or fertilizer material before being offered for sale accompanied by a guaranteed analysis showing the minimum percentages of plant food. Each and every brand of mixed fertilizer must remain uniform for the period of registration, and in no case, even at a subsequent registration, shall the grade of quality be lowered.

Another provision of the bill requires the state authority, after a public hearing and upon approval of the director of the Agricultural Experiment Station, to promulgate a list of grades of mixed fertilizer adequate to meet the agricultural needs of the State. After this list of grades has been established, no other grades of mixed fertilizers would be eligible for registration, except that higher multiples of the ratios carried by the approved grades may be permitted with the approval of the state authority and the director of the Experiment Station. Revisions in the list of grades could not be made more often by the State authority than once a year.

False or misleading statements are made unlawful as well as any misleading or deceptive trademark or brand name in connection therewith.

All persons registering mixed fertilizers and fertilizer materials under the law would have to furnish a confidential written statement of the tonnage of each grade of fertilizer sold by him in the state. Failure to submit such information would be followed by cancellation of the registration. These reports would cover the period from July 1st to December 31st, and from January 1st to June 30th.

The state authorities would be required to publish at least annually information concerning the production and use of mixed fertilizers and fertilizer materials and a report of the results of the analyses based on official samples of mixed fertilizers and fertilizer materials sold within the state. This information would be made public twice a year covering the first six months of the fertilizer year and the later six months.

Potash Allo ation Report Data Filed

Allocation of the 795,880 tons of domestic potash (K_2O) available for distribution from June 1, 1946, to March 31, 1947, has been completed with the appointment of 35,606 tons to new or expanded fertilizer plants and a supplementary allotment, 7,566 tons, to established mid-western plants, CPA has announced.

Control Officials Form New Association

At the annual meeting of the Association of Official Agricultural Chemists, held in Washington on October 14th to 17th, a new organization of fertilizer control officials, to be known as The Association of American Fertilizer Control Officials, was formed.

Officers elected are: President, D. S. Coltrane, Assistant Agriculture Commissioner from North Carolina, Raleigh, N. C.; Vice-President, Allen B. Lemon, Chief of the Bureau of Chemistry, State Department of Agriculture, Sacramento, Calif.; Secretary-Treasurer, H. R. Walls, Chief Chemist of the Feed and Fertilizer Inspection Service, College Park, Md.

Members of the Executive Committee, which also includes the officers, are: B. D. Cloaninger, Head of the Department of Fertilizer Inspection and Analysis, Clemson, S. C., and L. S. Walker, Chemist inCharge of the Tegulatory Service, Agricultural Experiment Station, Burlington, Vt., elected for a two-year term; Dr. F. W. Quackenbush, State Chemist, Department of Agricultural Chemistry, Indiana Agricultural Experiment Station, Lafayette, Ind., and Dr. J. F. Fudge, State Chemist, College Station, Texas, elected for a one-year term.

Objectives

The objects of the Association, as outlined in the constitution adopted, are "to promote uniform and effective legislation, definitions, rulings and enforcement of laws relating to the control of sale and distribution of mixed fertilizers and fertilizer materials in the Continent of North America."

For the purpose of studying "uniformity in legislation, definitions and rulings, and the enforcement of laws," the constitution stipulates that the president "may appoint investigators or committees" for one-year terms with the provision that "no appointment shall be made for a period exceeding two years."

The incoming president of the Association is directed, under the constitution, to "appoint annually a States Relations Committee consisting of seven members who are representative of the different areas" and the president and secretary-treasurer are to serve as ex-officio members. Duties of the committee are "to encourage and foster proper relations between states in uniform laws, registration and labeling fertilizers, uniform

and effective standards, regulations and other matters toward uniform and effective fertilizer control."

Membership in the Association consists of: (1) officers charged by law with the active execution of the laws regulating the sale of commercial fertilizers and fertilizer materials; (2) deputies as shall be designated by control officials and (3) research workers employed by State, Dominion, or Federal Agencies who are engaged in the investigation of fertilizers.

A "Proposed Model State Fertilizer (Control) Bill" was prepared by a Special Committee of Fertilizer Control Officials and a Committee of the American Society of Agronomy with D. S. Coltrane serving as chairman. The proposed bill was approved at a meeting of the Association. A summary of the proposed bill appears elsewhere in this issue.

The committees are as follows: Fertilizer Control Officials—D. S. Coltrane (chairman), Assistant Agriculture Commissioner, Raleigh, N. C.; L. E. Bopst, State Chemist, Inspection and Regulatory Service, College Park, Md.; F. W. Quackenbush, State Chemist, Department of Agricultural Chemistry, Agricultural Experiment Station, Lafayette, Ind.; J. F. Fudge, State Chemist, College Park, Texas; W. B. Griem, State Chemist, Department of Agriculture, Madison, Wis.; George H. Marsh, Director of the Division of Agricultural Chemistry, State Department of Agriculture, Montgomery, Ala.; John B. Smith, State Chemist, Agricultural Experiment Station, Kingston, R. I.; and Allen B. Lemon, Chief of the Bureau of Chemistry, State Department of Agriculture, Sacramento, Calif.

American Society of Agronomy—S. B. Randle, State Chemist, New Brunswick, N. J. (alternate for F. E. Bear, committee chairman); K. D. Jacob, Principal Chemist, Bureau of Plant Industry and Soils, U. S. D. A., Beltsville, Md.; J. Fielding Reid, Associate Chemist, Agricultural Experiment Station, Raleigh, N. C., and C. E. Millar, Head of the Department of Soils, Michigan State College, East Lansing, Mich.

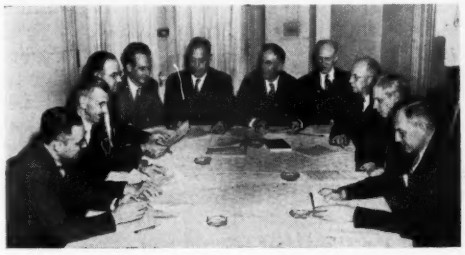

Photo by the American Plant Food Council

Studying Proposed Model Control Bill

After forming the Association of American Fertilizer Control Officials, the first act of the new organization was to approve a "Proposed Model State Fertilizer (Control) Bill." Shown studying provisions of the new proposed measure are, left to right F. W. Quackenbush, State Chemist, Department of Agricultural Chemistry, Agricultural Experiment Station, Lafayette, Ind.; George H. Marsh, Director, Division of Agricultural Chemistry, State Department of Agriculture, Montgomery, Ala.; B. D. Cloaninger, Head of the Department of Fertilizer Inspection and Analysis, Clemson, S. C.; S. B. Randle, State Chemist, New Brunswick, N. J.; J. F. Fudge, State Chemist, College Station, Texas; D. S. Coltrane, Assistant Commissioner of Agriculture for North Carolina, Raleigh, N. C. (president); K. D. Jacob, Principal Chemist, Bureau of Plant Industry and Soils, U. S. D. A., Beltsville, Md.; John B. Smith, State Chemist, Agricultural Experiment Station, Kingston, R. I.; W. B. Griem, State Chemist, Department of Agriculture, Madison, Wis.; and L. E. Bopst, State Chemist, Inspection and Regulatory Service, College Park, Md.

Photo by the American Plant Food Council

Officers of Fertilizer Control Officials

Seated, left to right B. D. Cloaninger, Head of the Department of Fertilizer Inspection and Analysis, Clemson, S. C., member of Executive Committee; D. S. Coltrane, Assistant Agriculture Commissioner for North Carolina, Raleigh, N. C., President; H. R. Walls, Chief Chemist, Feed and Fertilizer Inspection Service, College Park, Md., Secretary-Treasurer. Standing, left to right Dr. F. W. Quackenbush, State Chemist, Department of Agricultural Chemistry, Agricultural Experiment Station, Lafayette, Ind., Member of Executive Committee; Dr. J. F. Fudge, State Chemist, College Station, Texas, Member o Executive Committee, and L. S. Walker, Chemist in Charge, Regulatory Service, Agricultural Experiment Station, Burlington, Vt., Member of Executive Committee. Allen B. Lemon, Chief of the Bureau of Chemistry, California Department of Agriculture, Sacramento, Calif., who was elected vice-president, was not present at the meeting

Present Status of Potato Fertilizer Placement

By BAILEY E. BROWN

Formerly Senior Biochemist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, United States Department of Agriculture.[1]

(Continued from the issue of October 19, 1946)

Broadcasting

Prince (*18*), of the New Hampshire Agricultural Experiment Station, reporting in 1937 on the results of a 5-year comparison of fertilizer broadcast and plowed under versus fertilizer in the hill (presumably side-band placement) showed an average gain of 13 bushels per acre for the "hill" placement. The fertilizer was a 4–8–7 mixture applied at the rate of 2,000 pounds per acre. The same investigator (*19*), reporting on experimental fertilizer placement studies conducted in 1940, stated that side-band placement outyielded the broadcast method by 62 bushels per acre. When the fertilizer was "split" by putting the P-K in bands and broadcasting the nitrogen fertilizer, the yield was 29 bushels less per acre than with the side-band method; and when the phosphorus fertilizer was applied in bands and the N–K broadcast, a lower yield by 49 bushels resulted than from side-banded complete fertilizer.

Prince (*20*), on the basis of results obtained in 1944, reported that fertilizer broadcast produced 29 bushels less per acre than when applied as side bands (5-year average).

In 1942, Campbell (*5*), of the New Jersey Agricultural Experiment Station, reported that applying 1,400 pounds of 4–12–8 before plowing plus 700 pounds in side-bands at planting produced 39 bushels less per acre than was obtained by applying 2,100 pounds as side-bands.

Ellis (*10*), of the Indiana Station, reporting on the results of potato fertilizer placements studies conducted on muck soil in 1937, stated: " . . . . the only conclusion to be drawn was that smaller amounts of fertilizer, 500 pounds, applied in the row or in bands beside the row, were as effective as 1,000 pounds broadcast." Reporting on similar work in 1938, Ellis (*11*) stated: "The potato crop responds to the fertilizer treatment in bands to the side and below the seed piece in preference to broadcast treatment. Row (band) applications of 500 pounds per acre are equivalent to 1,000 pounds per acre broadcast. Side-band applications up to 1,000 pounds per acre will give increases in yield great enough to make the application profitable."

Nettles (*15*), of the Florida Agricultural Experiment Station, conducted fertilizer placement tests on potatoes for 2 years, 1937–1938. Three methods of fertilizer placement were compared in the Florida trials: (1) in a band on each side, (2) in the furrow row, and (3) broadcast. In 1937, a reportedly poor growing season, the broadcast method outyielded the band placement by 28 bushels per acre. The band placement method outyielded the in-the-furrow method, where a greater chance for contact of fertilizer with the potato seed pieces might be assumed, by 18 bushels per acre.

In 1938, however, there was a reversal of the above trend in that the side-band placement method outyielded broadcasting the fertilizer by 29 bushels per acre, with only 4 bushels increase over the in-the-furrow placement. This test was conducted at Lacrosse, Fla., on Blanton fine sand. In a second fertilizer placement test at Lacrosse, Fla., on Orlando fine sand the in-the-furrow method produced a higher yield by 11 bushels per acre than the side-band placement and 26 bushels more per acre than the broadcast method. In this test the side-band placement outyielded the broadcasting method by 15 bushels per acre.

Smith (*21*), of the New York (Cornell) Station, conducted studies in 1942 involving fertilizer placement and rate of application, variety, seed spacing and size of seed piece for a total of 20 comparisons of side-band placement with one-half of the fertilizer broadcast and plowed under, and one-half applied through the planter in Hi-Lo bands. Average

yields for the 20 tests were 270 bushels per acre for the side-band placement, 263 bushels for the 50–50 combination broadcast and Hi-Lo-band placement.

Smith, Kelly, and Hommel (*22*) conducted further experiments in 1943 on the relation of fertilizer placement, rate of application, source of nitrogen and potassium, irrigation, and distance of spacing seed to yields of potatoes. Twenty-nine comparisons were made of (1) side-band placement with (2) three-fourths broadcast before plowing and one-fourth in side bands. The average yield of the 29 comparisons was 243 bushels per acre for the side-band placement; 237 bushels for the combination broadcast-side-band placement method.

Brasher (*1*), of the Delaware Station, reporting on fertilizer placement studies conducted in 1944, found that 1,000 pounds of fertilizer applied in side-bands gave a yield of 123 bushels per acre; when broadcast and plowed down, 113 bushels; and when broadcast after plowing, 110 bushels. Smith and Kelly (*20*) carried on some interesting fertilizer placement tests in 1944 employing two rates of 5–10–10 fertilizer—1,200 and 2,400 pounds per acre—and three methods of placement: (1) all in side-bands; (2) one-half broadcast and plowed under, one-half in side-bands; and (3) one-half on plow furrows one-half in side-bands. Average yields for both rates of fertilizer application for the three methods of placement were, respectively 293, 335, and 324 bushels per acre.

Gray (*12*), of the American Potash Institute, conducted 7 tests in 1944, comparing (1) all fertilizer in side-bands with (2) one-half broadcast and plowed under, the rest in side-bands. The latter method invariably gave higher yields than the side-band placement, ranging from 10.75 to 68.84 bushels increase per acre, the average increase for all locations having been about 38.3 bushels. Gray, in connection with previous tests, stated: "Similar field experiments during the past four years have shown consistent and profitable increases for the plow-under practice.[10] The average increase for 5 experiments in 1943 was 61.42 bushels per acre and for 7 experiments in 1944 the average increase was 38.3 bushels per acre. For the 2 years, 1943–1944, the average increase was 49.86 bushels."

Finally, some attention has been given to broadcasting and plowing under one-half of the fertilizer application in the fall, the rest of the fertilizer being applied in side-bands at planting time. This method is reported to have given higher yields than by applying all the fertilizer in side-bands at planting time. It is obvious, however, that more experimental work will be necessary before attempting to evaluate fall-applied fertilizer.

Plow-Furrow-Placement

Comparatively little work has been done on placing fertilizer on the plow furrow for the potato crop. In going through the various *Proceedings* of the National Joint Committee on Fertilizer Application (1931–1944) it was not until the 1943 report that the writer found any reference to such a method. It is obvious, therefore, that hardly enough results are available to evaluate this method in comparison with the standard side-band placement method. However, brief reference to what has been so far reported may be of interest.

This method is sometimes inaccurately referred to as "plow-sole" placement. Generally speaking, plow sole refers to "A compacted layer of earth formed at the bottom of the furrow by the passage of the plow, especially when plowing continually at the same depth;—called also plowpan and sometimes hardpan."[11]

Parker, *et al.* (*16*) conducted fertilizer placement experiments with Irish Cobbler potatoes on a Sassafras fine sandy loam at Onley, Va., in 1943. Three placements of a 5–10–5 fertilizer were used at the respective rates of 2,000 and 3,000 pounds per acre. The three placements of the fertilizer consisted of (1) a side placement 2 inches to each side of and below the level of the seed piece, (2) a plow-depth application in which the fertilizer was placed at time of plowing in narrow bands 8 inches apart and 8 inches below the surface of the soil, and (3) a surface application in which the fertilizer was drilled in narrow bands 8 inches apart and 2 inches below the soil surface after the area had been plowed. They reported that: "(1) the placement of fertilizer in bands 2 inches to each side of the seed piece produced the largest yield of 'Size A' potatoes (not less than 1 7/8 inches in diameter); (2) the yield produced by 2,000 pounds per acre of fertilizer side-placed was significantly better than that produced by placing either 2,000 or 3,000 pounds at plow depth, or by drilling similar amounts in the upper 2 inches of the soil surface; (3) side placement of the fertilizer was also significantly better than the yield from the combined applications where part of the fertilizer was drilled in and the remainder

(Continued on page 20)

[10] Combined with side-band placement, 50–50.

[11] As defined in Webster's *International Unabridged Dictionary.*

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N. F. A. Southern Convention

The program has been completed for the annual Southern Convention of the National Fertilizer Association, which will be held at the Biltmore Hotel, Atlanta, Ga., on November 11th, 12th, and 13th.

Monday, November 11th, will be devoted to meetings of the Board of Directors and of Association Committees. The general sessions will be held on Tuesday, November 12th, and Wednesday, November 13th. The annual dinner will be held on Wednesday evening.

The program for the two general sessions is as follows:

TUESDAY, NOVEMBER 12TH
10:00 A. M.
Weller Noble, *Chairman of the Board*, Presiding

SONG—"America"

INVOCATION—Rev. Matthew M. Warren, Rector, All Saints' Episcopal Church, Atlanta, Ga.

OPENING ADDRESS—Weller Noble, Chairman of the Board of Directors, The National Fertilizer Association

ADDRESS—"Association Activities," Maurice H. Lockwood, President, The National Fertilizer Association, and Members of the Staff

ADDRESS—"Some Postwar Agricultural Problens That Must Be Solved," Dr. M. J. Funchess, Director, Agricultural Experiment Station, Auburn, Ala.

PANEL DISCUSSION ON THE LEGISLATIVE OUTLOOK—C. T. Prindeville, presiding; Maurice H. Lockwood, B. C. Goss, J. H. Epting, R. L. King

WEDNESDAY, NOVEMBER 13TH
10 A. M.
Weller Noble, *Chairman of the Board*, Presiding

ADDRESS—"The Revolution in Agriculture in the Mid-South," W. C. Lassetter, Vice-President and Editor, The Progressive Farmer Company, Memphis, Tenn.; President, The Association of Southern Agricultural Workers

ADDRESS—"Science Remaking the South," Dr. L. D. Baver, Director, Agricultural Experiment Station, Raleigh, N. C.

ADDRESSES—"The Situation with Respect to Fertilizer Supplies":

World—Dr. O. E. Overseth, Secretary, Committee on Fertilizers, International Emergency Food Council, Food and

Agriculture Organization of the United Nations, Washington, D. C.

United States—L. G. Porter, Chief, Fertilizer Division, Materials and Equipment Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C.

ADDRESS—"Car Services Problems," R. C. Megee, Association of American Railroads, Washington, D. C.

NEW AND UNFINISHED BUSINESS

ADJOURNMENT

Bemis Appoints Buck Kansas City Manager

Bemis Bro. Bag Company announces the appointment of T. A. Buck as sales manager of their Kansas City organization. Mr. Buck has been associated with Bemis for more than eleven years. Most of his diversified experience has been concentrated in the southwest, particularly in Kansas and Texas.

Obituary

Frederic Juenger

Frederic Juenger, traffic manager of the Texas Gulf Sulphur Company for twenty-seven years, died on October 21st at Union Hospital in New York.

Born in Houston, Texas, on September 30, 1883, Mr. Juenger obtained his first employment with the railroads in that city. He subsequently moved to New York and served during World War I as traffic manager of the Southern Cotton Oil Company. In 1919 he became traffic manager of the Texas Gulf Sulphur Company.

He was a member of the Traffic Club of New York and of the Masons. He is survived by his widow and his niece, Alice May Juenger, both of New York, and a brother, Ben, of Houston.

John A. Parker

John A. Parker, Secretary and Treasurer of the Gulfport Fertilizer Company, Gulfport, Miss., died on October 17th. Mr. Parker had been connected with the company in executive capacity for the past twenty-five years.

California Fertilizer Association Holds Successful Meeting

With a membership covering almost 100 per cent of the fertilizer companies in the State, the California Fertilizer Association held its 23rd Annual Meeting on October 15th and 16th at Beverly Hills, Calif. The two sessions presented a well-planned series of talks that covered the principal problems confronting the industry today.

President Ned Lewis reviewed a successful year's work and expressed appreciation for the cooperation of other organizations.

C. T. Prindeville, Chairman of the National Fertilizer Association's Public Relations Committee, talked on "Building a Chain of Goodwill" in industry and public understanding.

Dr. F. W. Went, California Institute of Technology, described studies with tomatoes, emphasizing the importance of night temperature in its effect on fruiting, before the effect of other important factors such as applied fertilizers can be accurately evaluated.

Allen B. Lemmon, Chief of the California Bureau of Chemistry, commended the industry for its high standard of compliance with the California control laws, and pointed out some details in which further improvements might be made. He frankly criticized some sellers of liquid fertilizer for making claims as to relative crop producing value of their products, compared with solid forms, some of which from an analysis standpoint seemed quite unwarranted from a control point of view.

Dr. W. W. Robbins of the University of California presented an instructive talk on "How Plants Grow," and entertained the convention listeners with a lively series of witty remarks, effectively sprinkled through his informative demonstration.

Cedric Gran of OPA said that, judging from experience in both business and government, there is need for respect and confidence on the part of each. He especially stressed the need for a more complete "public trusteeship" attitude on the part of business in its relations with government.

Dr. W. T. McGeorge of Arizona discussed "Fertilizers and Arid Soils," and emphasized the need for preventive plant feeding, as contrasted with post mortem or corrective practice.

Weller Noble, Pacific Guano Company, suggested the industry's need to be sure its distribution practices and attitudes have not

departed from sound and courteous "service to the user" attitudes.

Maurice Lockwood, President of the National Fertilizer Association, discussed the importance of sound usage promotion programs and of constructive relations with agricultural research and educational agencies. Expressing confidence in the outlook for free enterprise developing further the phosphate deposits of the intermountain area, and for assimilation of still more nitrogen plants by business enterprises, he stated that supply and demand would be balanced for fertilizers without government intervention. Warning, however, that legislation proposing government intrusion in fertilizer production and distribution would likely be reintroduced in the 80th Congress, he urged industry members to contact members of the House and Senate while they are at home. Such presentation of the industry's point of view will pave the way for follow-ups that may be needed later to assure sound knowledge of fertilizer facts by our legislators.

Officers elected for the year 1947 were as follows: President, Dr. Wallace Macfarlane, Pacific Guano Company, Los Angeles; Vice-President, Earl R. Mogg, Growers Fertilizer, Stockton; Secretary, Paul Pauly, Pacific Guano Company, Los Angeles; Treasurer, Grover C. Dunford, Inland Fertilizer Company, Los Angeles; Directors for three-year term, Weller Noble, Pacific Guano Company, Berkley; James M. Quinn, California Sun Company, Los Angeles; E. Thacher, Parco, Inc., Los Angeles.

Two-year European Food Shortage Predicted

Europe will continue to need much more food than it can produce for at least two more years, Director Homer J. Henney of the Colorado A. and M. College Experiment Station declared recently. Henney spent late 1945 and early 1946 in Europe as deputy director of food and agriculture for the U. S. Military Government.

The basic reason, he explained, is lack of commercial fertilizers.

"There is no such thing as natural fertility left in European soil," he said. "Crop yields can be produced there only by use of commercial fertilizers, and the machinery for getting these fertilizers into Europe broke down with the end of the war. Where our crop yields are controlled largely by weather, European crop yields are controlled by and large by the amount of fertilizer put in the soil. This is true especially in Germany, Poland, Czechoslovakia, Hungary, Austria, and Yugoslavia.

"The 1945 crop was produced on fertilizer the Germans got in 1944. Virtually none was gotten in 1945 for the 1946 crop. Even if adequate supplies are obtained for the 1947 crop, maximum yields cannot be expected before 1948, for it takes time to build up soil fertility."

Florida Fertilizer Ceilings Raised

Manufacturers' ceilings on sales of chemical plant foods to dealers and consumers in Florida were raised approximately 6 per cent by the Office of Price Administration October 23rd, in Amendment 7 to Second Revised MPR 135. With the exception of an August 9, 1946, action to reflect increased costs of freight and phosphate rock, the new action is the first general retail price increase on mixed fertilizers granted since August 17, 1943.

An example of the new retail ceilings is that of $34.50 per ton for 100-pound bags of 3–8–5 mixed fertilizers. The former ceiling was $32.80 per ton.

FERTILIZER MATERIALS MARKET

NEW YORK

Interest Centers in Possible Decontrol of Fertilizer Materials. Sales of Mixed Fertilizers Continues Upward. Shortage in All Materials Continues without Prospects of Improvement for Current Season. Potash Allocated to New Fertilizer Mixers.

Exclusive Correspondence to "The American Fertilizer"

NEW YORK, October 28, 1946

Interest in the fertilizer materials markets at this time is mainly concerned with possible government decontrol of most basic items. Ceilings have already been lifted from the majority of the organics, but chemical fertilizers remain firm under OPA prices. Demand for sulphate of ammonia, potash and superphosphates remain unusually high, but production has been booked to current capacity levels.

Sales of commercial fertilizers continue to show an upward trend each month, and total tonnage for the month of September, this year, was approximately 50 per cent higher than the total sold in September, 1945. The biggest increases reported came from the mid-Western area.

Sulphate of Ammonia

Production by the steel industry shows a steady increase but is still not able to fulfill requirements of many fertilizer mixers. It is hoped that the government program for producing ammonium nitrate will ease the tight position of sulphate. Ammonia liquors are in heavy call and fall far short of meeting present demand.

Nitrate of Soda

Domestic production remains subnormal due to the shortage of raw materials, and the increases in imported supplies have not been realized as yet. Demand from farmers is unusually heavy for this time of year, and apparently orders are being placed now in anticipation of shortages later in the season.

Organic Materials

In spite of the removal of ceilings on packing-house by-products, the supply situation has not improved as far as the fertilizer industry is concerned. The market is nominally higher, but demand from the feed trade has taken all available supplies.

Superphosphate

The present market position is tight with a continuing demand from fertilizer manufacturers. Stocks remain subnormal while current production is slightly under that of a year ago. Demand for triple superphosphate from all sections of the country is extremely heavy, but productive capacity has been entirely committed.

Phosphate Rock

No easing in the tight position of this material can be reported, but it is hoped that new mining operations in Florida will tend to relieve the situation early next year. Foreign inquiry is becoming increasingly heavy but remains unfilled.

Potash

Allocations to new fertilizer mixers have recently been announced by CPA, and buying activity has been confined to cover these additional requirements. Production at the mines continues at capacity and shipping schedules have been maintained for the most part in spite of the increasing difficulty in obtaining transportation. It is reported that some foreign potash may move to this market after the first of the year, but this possibility has not been confirmed as yet.

CHICAGO

Decontrol of Meat Has Not Yet Helped Fertilizer Organics Market. Feed Prices Fluctuate.

The removal of price control on livestock and the consequent large receipts had no effect on the market of organics. No offerings of fertilizer tankage have appeared, although a few cars of nitrogenous were reported booked at the old ceiling price.

Wide fluctuations in prices occurred in the feed trade when ceilings on livestock were eliminated.

PHILADELPHIA

Materials Still in Short Supply but Imprvoement Is Expected. More Packing House Organics in Prospect for Feed Trade.

Exclusive Correspondence to "The American Fertilizer"

PHILADELPHIA, October 28, 1946

The efforts of the fertilizer mixer to anticipate, and possibly increase, his production of complete goods, are not receiving much reward. Raw materials are still in scarce supply, although the general shortage is not now so pronounced, and it may not be too long before the tables are turned and sellers will be seeking outlets.

Sulphate of Ammonia.—Demand still continues active, with deliveries lagging somewhat. Shortage of sulphuric acid is blamed for some of the production shrinkage. There is said to be good export inquiry.

Nitrate of Soda.—Market is tight. Soda ash scarcity has kept domestic production down. Demand for agricultural use seems to be increasing, but present conditions will not permit delivery of much material in advance.

Castor Pomace.—No new offerings, but some movement on contracts.

Blood, Tankage, Bone.—These materials are in very short supply, but it is expected that with the resumption of operations the packing houses will again have something to offer. It is still too soon to expect any large quantities, but there has been some trading at $9.00 to $10.00 per unit of ammonia ($10.99 to $12.15 per unit N), in fact, cracklings and high grade blood have been even higher.

Fish Scrap.—Bad weather recently interfered with fishing, but the fleet is now out again. While there is quite active demand for scrap and meal, there are few, if any, offerings to report. In any event, the feeding trade takes all this fish material.

Phosphate Rock.—The position remains tight, and demand continues beyond production capacity.

Superphosphate.—Production is somewhat reduced and stocks are below this time last year. Demand is steady and market position tight.

Potash.—Heavy demand continues with shipments lagging somewhat, and future prospects not very encouraging for full supply. The situation is not helped by the shortage of by-product potash. There is some trading in carbonate of potash for tobacco goods.

A. O. A. C. Annual Meeting

The 60th Annual Meeting of the Association of Official Agricultural Chemists was held at Washington on October 14th, 15th and 16th. A number of papers on fertilizers and fertilizer analysis methods were presented.

The Presidential address by Dr. William H. Ross, of the U. S. D. A., on "The Influence of Fertilizers in Promoting Crop Growth" presented data to show the errors in the widespread idea that U. S. soils are becoming poorer all the time. According to Dr. Ross, our soil is constantly improving, due to the use of fertilizers and improved seeds

Titles of other fertilizer papers were: "The Determination of Nitrogen in High Analysis Materials" by Arthur L. Prince, New Jersey Experiment Station; "The Efficiency of Ammoniated Superphosphates in Promoting Crop Growth" by William H. Ross, J. Richard Adams, and John O. Hardesty, all of the Bureau of Plant Industry, U. S. D. A.; "Potash" by O. W. Ford, Indiana Experiment Station; "Phosphoric Acid" by K. D. Jacob and C. Pinkerton, U. S. D. A.; "The Determination of Phosphoric Acid in Fertilizers in the Presence of Organic Matter" by H. R. Allen and Lelah Gault, Kentucky Experiment Station; "Modifications of the Wagner Pro-

cedure and Its Adaption for P_2O Availability of Fused Tertiary Phosphates" by Dr. W. H. MacIntire, L. J. Hardin and Dr. Meyer of the Tennessee Experiment Station.

Dr. G. S. Fraps, former State Chemist of Texas, made his report as general referee on fertilizers. It was announced that he is being succeeded by Dr. F. W. Quackenbush, State Chemist of Indiana.

Officers elected for the coming year are: President, J. O. Clarke, Food and Drug Administration, Chicago, Ill.; Vice-President, G. H. Marsh, Montgomery, Ala.; Secretary-Treasurer, H. A. Lepper, Washington, D. C.

Less Peruvian Guano Expected

According to an article in *Liberty* by William Vogt, the output of guano from the Peruvian islands is expected to drop sharply, due to changes in the Humboldt Current which furnishes the food supplies for the millions of gannets inhabiting these islands. With the entry of warm tropical waters from the open Pacific the fish are driven away from the islands and when forced to fly beyond 60 miles from land for their food, the birds cannot maintain the normal population. It is expected that over one million gannets will perish from starvation and epidemics during the coming year. In anticipation of the reduced guano supply, the Peruvian government has begun the importation of other fertilizer materials to protect the country's agriculture.

No Early Relief from Nitrogen Shortage

Farmers cannot expect much relief from the fertilizer shortage in the immediate future from the War Department's conversion of 17 army ordnance plants for the production of fertilizer, Dr. N. J. Volk, associate director of the Indiana Agricultural Experiment Station, Purdue University, said today.

Dr. Volk, chairman, National Joint Committee on Fertilizer Application, explained that the output of these plants will be sent to the United States occupied zones overseas, to promote food production. Furthermore, if all of these plants go into production, they will make only ammonium nitrate and not mixed fertilizer. There is a shortage of potash and phosphorus also. Consequently, there will be no increase in the amount of mixed fertilizer available in the near future.

It should be kept in mind, he said, that for the remainder of 1946, at least, the entire

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Up to 1940, I. P. Thomas and Sons Co., of Camden, N. J., packed its mixed fertilizers in 167-lb. open mouth burlap bags.

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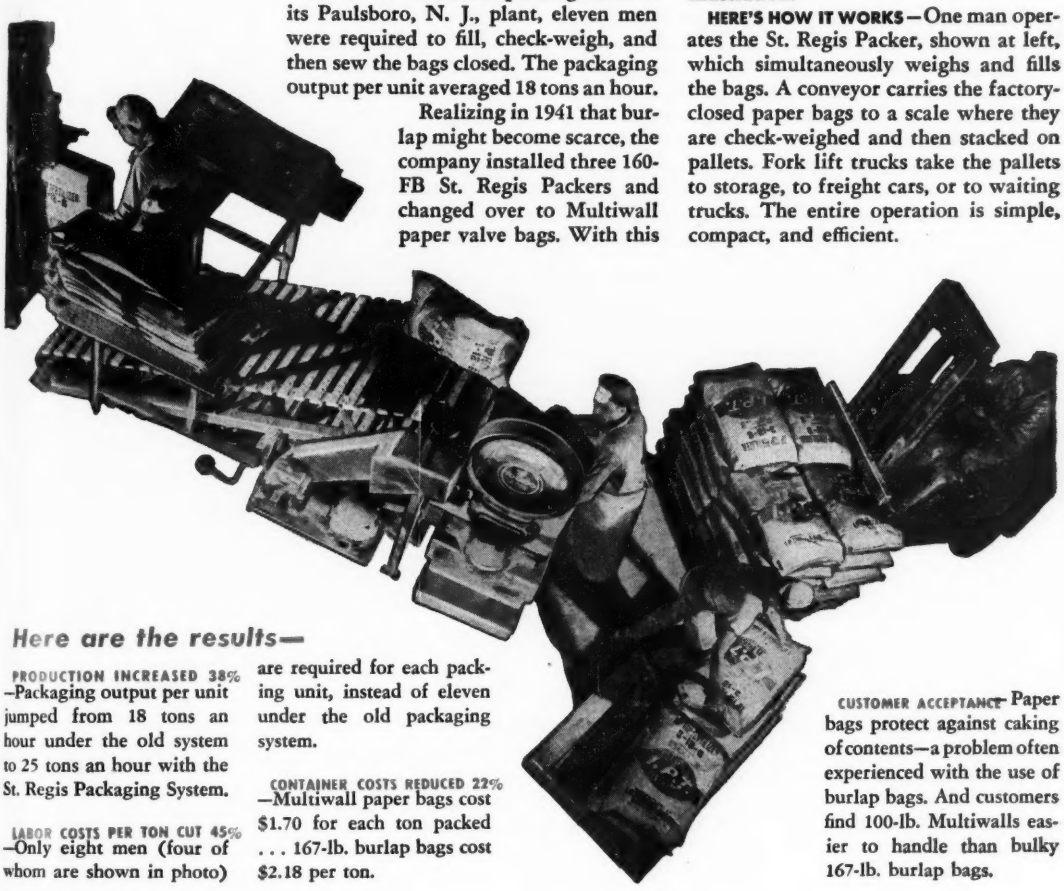

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ammonium nitrate output of the wartime ordnance plants will be earmarked for export to American occupied zones in Europe and Asia. Severe food shortages are likely to continue in these continents well into 1947 or longer. This fertilizer material will be much needed as a means of helping boost crop production in the occupied areas next year.

Many farmers have been under the impression, since the announcement by the war department of the conversion of these plants, that the resulting output would swell the amount of plant food available for their needs, but such help likely will not come until late in 1947, in the opinion of Dr. Volk.

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WANTED—One Model 515-B Automatic Weighing Scale in good usable condition. The Rogers & Hubbard Company, Portland, Conn.

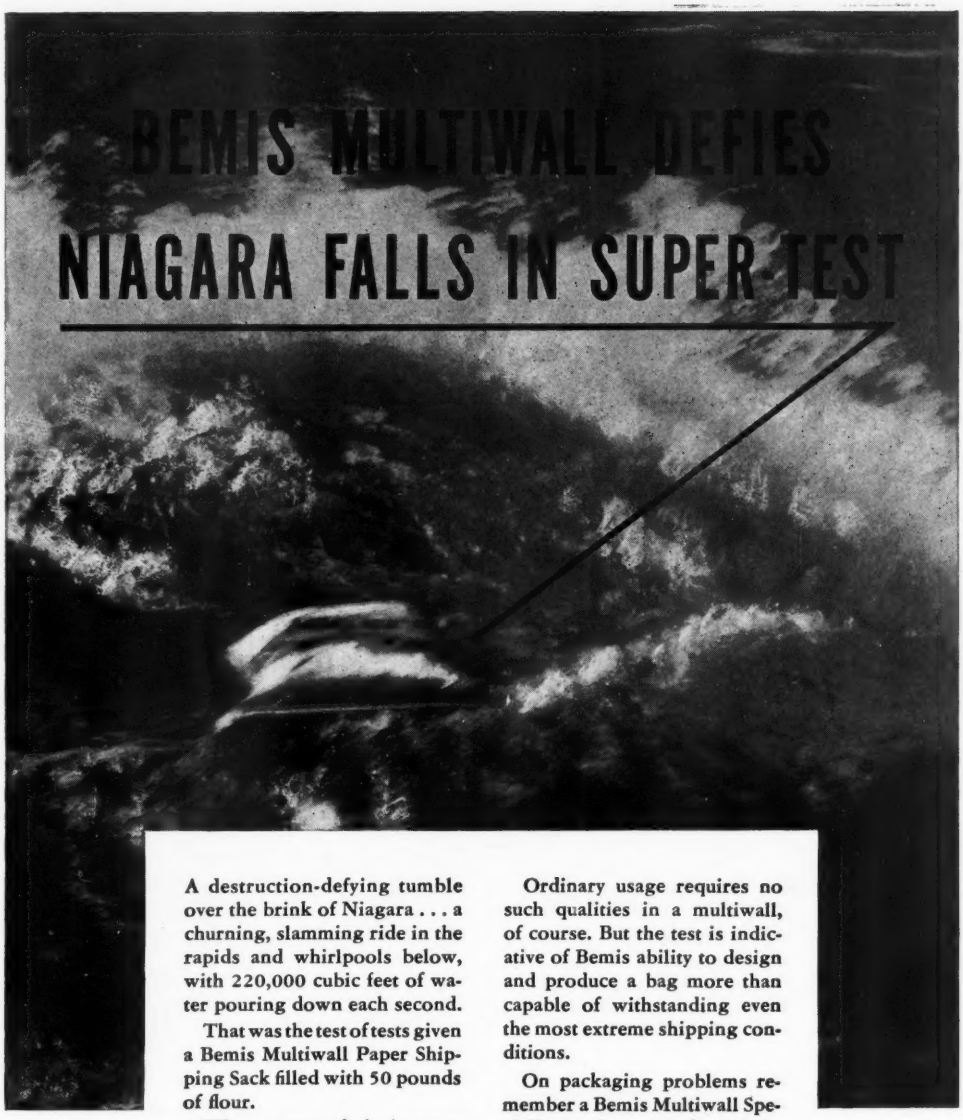
POTATO FERTILIZER PLACEMENT

(Continued from page 11)

side-placed; but (4) side placement was not better than that from the combined application where part of the fertilizer was placed at plow depth and the remainder side-placed."

Before leaving the Virginia study the writer would like to quote two paragraphs from the report of these investigators as follows: "Soil moisture conditions following planting and during the first part of the season were favorable for growth, but during the latter part of the season a combination of low soil moisture and high air temperature retarded both plant and tuber growth. The first 3 weeks after planting 2.29 inches of rain fell (March 10), 2.75 inches in April and 4.35 in May. Only 0.85 fell the month preceding harvest (June 28th) which is the period when the tubers should be making their greatest development. But, despite the lack of moisture, good yields were obtained from all of the plots. The distribution of the rainfall, however, may have influenced the effectiveness of the different placements of the fertilizer, in that early in the season, when soil moisture was favorable, side placement of the fertilizer gave the young plants a quick start. *The other placements of*

See page 30



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the fertilizer were too far from the seed piece to be immediately available. Later in the season when the plant roots had reached the deeply-located fertilizer (at plow depth) the soil dried out to the extent that lack of moisture retarded plant growth and prevented effective utilization of the fertilizer."

In connection with the foregoing quotations the writer has italicized one sentence which he believes truly "hits the nail on the head" when it comes to the inadequacy of plowing under, or placing fertilizer on the plow furrow for potatoes. In comparison with fertilizer bands relatively close to the seed piece there is a "timing" factor to consider in that fertilizer applied fairly close to the seed piece is in a position to become immediately available to the young potato plants; certainly much more so than where the placement is a relatively remote one. It might be conceded that deeper-than-close-to-the-seed-piece-placement is all right for certain crops such as corn and tomatoes, but not necessarily so for the potato crop. When the potato seed pieces are planted there is a relatively longer lag before root development starts than in the case of either corn or transplanted tomatoes. Potato rootlets arise from the base of the potato sprout and there is a tendency for them to arch over for a short distance before striking downwards. During this initial period of development the young plant has to depend mostly on the "mother" seed piece for nourishment, but it soon requires more immediately available food than from this natural source. It seems obvious that fertilizer placed 6, or more, inches beneath the seed piece will hardly fill the bill in comparison with fertilizer applied 2 inches away and level with or slightly below the lower plane of the seed piece, which at once becomes the reservoir of a needed food supply. Then, too, by the time the potato roots develop enough to reach the low-depth applied fertilizer, untoward weather conditions may result in a physiological setback from which the young plants may never recover and which, eventually, may be reflected in lower yields.

Parker *et al.* (*17*) on the basis of a similar comparison in 1944 had this to say: "The largest yield of 'A' size potatoes resulted from placing 2,000 pounds of fertilizer per acre in bands 2 inches to each side and near the level of the seed piece at time of planting. This same placement and rate of fertilization also gave the largest yields in 1943 which was a very dry potato season and similar to the 1944 one." In a further discussion of their results, they stated: "Similarly plow-depth applications were not sufficiently close to the growing roots to provide the right amount of nutrients for the best growth of plants."

Campbell (*6*), on the basis of placement studies conducted in 1943, reported that level-band placement of 2,000 pounds of 4–12–8 per acre, supplemented with chiseling to break up a plow sole, produced the highest yield, 296.8 bushels per acre; and that, without the chiseling, applying 700 pounds of fertilizer in side bands+300 pounds of limestone on plow furrow+1,300 pounds of fertilizer on the plow furrow gave a yield of 259.2 bushels per acre, a reduction of 37.6 bushels per acre. The regular dual-band placement, 2,000 pounds of 4–12–8 acre, without chiseling, gave a yield of 240.2 bushels per acre.

Smith, Kelly, and Hommel (*22*) in 1943 compared (1) fertilizer applied through the planter in equal-depth bands with (2) three-fourths of fertilizer applied in a band on "plow sole" and one-fourth applied through the planter in equal bands, for a total of 29 tests covering fertilizer placement, rate of application, source of nitrogen and potash, irrigation, and distance of seed spacing in relation to potato yields. The average yields for all tests were 243 bushels per acre for the equal-depth side-band placement and 228 bushels for the

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combination method of three-fourths of fertilizer on plow furrow, one-fourth in bands.

Smith and Kelly (*23*) in 1944 presented results of fertilizer applications, rate and method of placement and total yields. Three methods of fertilizer applications were compared: (1) all in equal-depth bands; (2) one-half broadcast and plowed under, and one-half in equal-depth bands; and (3) one-half on "plow-sole" and one-half equal-depth bands.

Referring to their 1943 results it will be noted that the equal-depth side-band placement produced an average yield of 15 bushels more per acre than the method of placing three-fourths of the fertilizer on the plow furrow and one-fourth in equal-depth bands. However, in 1944, when the equal-depth bands received one-half the fertilizer and one-half was placed on the plow furrow, this method, on the basis of average results, was superior by 33 bushels per acre for the 1,200 pound rate of application; and by 28 bushels for the 2,400-pound rate of application. Of the three placement methods compared in this study the one which involved broadcasting and plowing under one-half the fertilizer with the rest in equal-depth side-bands, gave the highest yields, namely, 50 bushels increase for the 1,200-pound rate, and 33 bushels increase for the 2,400-pound rate. The writers made one statement in their report which is of considerable interest: "In general, plants in plots receiving all of the fertilizer in bands at planting time matured and died earlier than those in which a portion of the fertilizer was broadcast before plowing or applied on the plow sole."

Merkle and Dunkle (*14*), of the Pennsylvania Station, conducted a field experiment in 1944 designed to compare row banding with plow-sole banding of all or part of the fertilizer. The fertilizers plowed down were banded on the plow-sole while all row applications were in bands 3 inches on each side of and on the same level as the seed piece. The writers had this to say relative to the tests: "All yields were low because of the hot dry summer. Much greater difference due to treatment might be expected in a normal season. The difference required for significance is small in this case. Comparing plots 2, 3, and 4 where 1,000 pounds of 4–8–8 is used, banding in the drill appeared to be superior to plowing down all or part of the fertilizer. Plots 5, 6, 7, and 8 compare 1,250 pounds of 4–8–8, all plowed down, ⅓down, ⅔down, and all in the drill. This comparison shows very little preference for one method of application over the other."

Brown (*2*), of the Connecticut Station, conducted a fertilizer placement test on potatoes in 1944. The highest yield (265 bushels per acre) was obtained from splitting the fertilizer as follows: One-half of the P + K on plow furrow, one-half of N + P + K in 2 bands by planter, and the balance of the nitrogen in 2 bands by hand. When all the fertilizer (N–P–K) was placed on the plow furrow the yield dropped to 219 bushels per acre. Concerning the results the following statement was made: "The data appear to warrant two statements, (1) placing all of the phosphorus on the plow-sole greatly retarded the early growth of the plants and consistently reduced the yield of tubers by approximately 10 per cent. (2) None of the 9 plow-sole placements resulted in significantly better stands, growth or yields than the same amount of fertilizer applied in 2 bands by the planter."

Chucka (*7*) reported on fertilizer placement results obtained in Central Maine and in Aroostook County, in 1944. In the first area, an application of 1,800 pounds of 6–9–15 in bands gave a yield of 198 bushels per acre while 1,200 pounds on plow furrow with 600 pounds in bands gave a higher yield by 12 bushels per acre. In Aroostook County, various placement comparisons, including band placement, broadcasting before and after plowing coupled with band placement, and placement in bottom of plow furrow in a "wide band" were made. Two varieties, Chippewa and Green Mountain, were grown in this test. Very slight differences among treatments were registered, but the average yield of both varieties was greatest where the side-band placement was employed. Lowest yield resulted from placing 1,500 pounds of fertilizer (6–6–12) on bottom of plow furrow with 500 pounds in bands.

Summary

Fertilizer placement studies on potatoes over a 14-year period are recorded herein. The

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chief ones considered include continuous-band broken-band, Hi-Lo, broadcast, and plow-furrow fertilizer placements. The placement most widely adopted up to the present time is the side-band method, which deposits the fertilizer in equal-quantity bands on each side of the seed piece, 2 inches from and level with or slightly below the lower plane of the seed piece. Thirty agricultural experiment stations now recommend this particular placement to potato growers.

The results of broken-band placement in comparison with continuous side placement indicated that the latter method gave higher yields. In considering the merits of these two methods of fertilizer placement account has to be taken of the mechanical difficulties, particularly in stony land, encountered with the broken-band method, plus the difficulty of synchronizing the position of the broken-band in relation to the seed piece.

The so-called Hi-Lo placement method, which places fertilizer in two bands, one band level with the seed piece, the other 2 to 3 inches lower, was compared with the standard side-band placement in Maine, New Jersey, and New York. In practically all the experimental trials, except on Long Island, in 1942, the standard method was superior to the Hi-Lo. In Maine and New Jersey during droughty seasons the Hi-Lo method failed to show any superiority over the level-band method, even though one band ("Lo") was presumably placed in a more favorable environment with respect to soil moisture. The Hi-Lo placement has been found also to be impracticable because of the fact that in order to place one band of fertilizer 2 to 3 inches below the seed piece the mechanical strain often resulted in breaking the large disk, particularly in rocky land.

As to broadcasting fertilizer, no experiment station recommends that all the fertilizer be broadcast, either before or after plowing. A few stations do recommend that, when the fertilizer application exceeds 1,000 pounds per acre, one-half be broadcasted before plowing; the other half applied in side-bands at planting. In some instances it is recommended that one-half the fertilizer be applied broadcast before plowing in the fall; the rest of the fertilizer in bands at planting. This method, however, has not been sufficiently tested to appear to warrant its recommendation to growers.

Applying fertilizer on the plow furrow has been studied but not to a sufficient extent to warrant definite recommendation. Studies made in Virginia over a 2-year period showed this method decidedly inferior to side-band placement. When all the fertilizer was applied on the bottom of the plow furrow, results have generally been inferior to side placement. When a part was applied in the plow furrow and a part as side-bands, results have been variable. In some experiments yields have been greater by this method than when all the fertilizer was in side-bands, but in at least an equal number of tests they have been poorer.

In evaluating the various placement methods tried out during the period 1931 to 1944, it would seem that the side-band method recommended by the National Joint Committee on Fertilizer Application has far surpassed all other methods in adaptability, ease of application, and, generally, in yield performance. Furthermore, it would seem logical to assume that any attempt to displace the recommended side-band method with any of the other methods reviewed herein should call for more experimental evidence before doing so, particularly in view of the fact that such methods require more than one operation to effect the fertilizer placement, whereas the band placement is an easy method, involving

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(*4*) Campbell, J. C., Hawkins, Arthur, Brown, B. E., and Chucka, J. A. (1945). "Fertilizer Placement for Potatoes: A comparison of level-band and Hi-Lo Methods," *American Potato Journal* 22(10):297–311.

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(*6*) Campbell, J. C. (1943). "Fertilizer Tests on Potatoes in 1943," *Proceedings 19th Annual Meeting of the National Joint Committee on Fertilizer Application*, pp. 171–174.

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(*11*) *Ibid.* (1938), p. 83.

(*12*) Gray, S. D. (1944). "Fertilizer Application Experiments on Potatoes," *Proceedings 20th Annual Meeting of the National Joint Committee on Fertilizer Application*, p. 100.

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(*14*) Merkle, F. G., and Dunkle, E. C. (1944). "Method of Applying Fertilizer on Potatoes," *Proceedings 20th Annual Meeting of the National Joint Committee on Fertilizer Application*, pp. 31–33.

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Fertilizer Production Started in Army Plants

Production of fertilizer grade ammonium nitrate has now started in the converted munitions plants, according to the War Department. It is expected that anhydrous ammonia will also start production shortly in three plants.

It is estimated that 684,000 tons of fertilizer materials will be produced in these plants by the end of summer, 1947. Most of this will go to occupied areas in Germany and Japan, while some will be used to replace nitrogen borrowed from American agriculture during the past year for export.

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AMMONIA—Anhydrous and Liquor
DuPont de Nemours & Co., E. I., Wilmington, Del.
Hydrocarbon Products Co., New York City.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Spencer Chemical Co., Kansas City, Mo.

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Bemis Bro. Bag Co., St. Louis, Mo.
Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Mente & Co., Inc., New Orleans, La.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAG MANUFACTURERS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
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Virginia-Carolina Chemical Corp., Richmond, Va

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Chase Bag Co., Chicago, Ill.
Fulton Bag & Cotton Mills, Atlanta, Ga.
Hammond Bag & Paper Co., Welisburg, W. Va.
Jaite Company, The, Jaite, Ohio
Raymond Bag Co., Middletown, Ohio.
St. Regis Paper Co., New York City.

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Utility Works, The, East Point, Ga.

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Baker & Bro., H. J., New York City.
Bradley & Baker, New York City.
Huber & Company, New York City.
McIver & Son, Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago. Ill.

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Bradley & Baker, New York City.
Huber & Company, New York City.
Keim, Samuel D., Philadelphia, Pa.
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Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

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Hayward Company, The, New York City.

BUCKETS—Elevator
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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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Bradley & Baker, New York City.
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Huber & Company, New York City.
International Minerals & Chemical Corporation, Chicago, Ill
McIver & Son. Alex. M., Charleston, S. C.
Scar-Lipman & Co., Inc., New York City.
Virginia-Carolina Chemical Corp., Richmond, Va.

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Keim, Samuel D., Philadelphia, Pa.

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McIver & Son, Alex. M., Charleston, S. C
Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

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McIver & Son, Alex. M., Charleston. S. C.
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Utility Works, The, East Point, Ga.

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Stedman's Foundry and Mach. Works, Aurora, Ind.
Utility Works, The, East Point, Ga.

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Bradley & Baker, New York City.
Scar-Lipman & Co., Inc., New York City.

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Utility Works, The, East Point, Ga.

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Virginia-Carolina Chemical Corp., Richmond, Va.

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Scar-Lipman & Co., Inc., New York City.
Schmaltz, Jos. H., Chicago, Ill.

UREA
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UREA-AMMONIA LIQUOR
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